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First record of the jacobsoniid beetle genus *Derolathrus* Sharp (Coleoptera, Jacobsoniidae) from China with the description of a new species

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Abstract

The jacobsoniid beetle genus *Derolathrus* Sharp in Sharp & Scott, 1908 is recorded from China for the first time. A new species, *Derolathrus hainanensis* **sp. nov.**, is described; the specimen was collected beneath the bark of a decaying broadleaf tree. A checklist and an updated key to the known species of *Derolathrus* are provided.

Key Words

Coleoptera, Staphylinoidea, *Derolathrus*, Hainan Island, taxonomy

Introduction

The small-sized beetle family Jacobsoniidae comprises only three extant genera: *Derolathrus* Sharp in Sharp & Scott, 1908, *Saphophagus* Sharp, 1886 and *Sarothrias* Grouvelle, 1918. This family currently includes 30 described species (26 extant and four fossil species), distributed sporadically across the Australian, Oriental and Neotropical Regions (Cai et al. 2015, 2017; Yamamoto et al. 2017; Yin and Bi 2018; Háva 2021; Tihelka et al. 2022; Peris et al. 2023; Théry 2023a, 2023b).

Members of the family Jacobsoniidae are small to minute in size, with body lengths ranging from 0.65 to 2.50 mm (≤ 1 mm for *Derolathrus* species) (Franz 1969; Peck 2010; Bi et al. 2015; Cai et al. 2015; Théry 2023a). The biology of this family remains poorly understood. Specimens are typically collected from leaf litter or decaying wood (Lawrence and Leschen 2010; Yin and Bi 2018; Peris et al. 2023). *Derolathrus* species have additionally been recorded from fungal fruiting bodies and bat guano (Lawrence and Leschen 2010; Yin and Bi 2018; Peris et al. 2023), while *Sarothrias* species are suspected to be associated with ants (Yin and Bi 2018; Peris et al. 2023).

The genus *Derolathrus* comprises 13 known species (10 extant and three fossil species; Háva (2021); Peris et al. (2023); Théry (2023a, 2023b)). Members of this genus can be distinguished from other jacobsoniid beetles by their 3-3-3 tarsal formula and a distinct antennal club composed of two fused articles (except *D. capdoliensis*) (Burckhardt and Löbl 1990; Lawrence and Leschen 2010; Peck 2010; Bi et al. 2015; Théry 2023a).

In China, Bi et al. (2015) first documented the presence of the family Jacobsoniidae in this region, describing *Sarothrias sinicus* Bi & Chen, 2015 from Xizang Province, China. Subsequently, Yin and Bi (2018) described *Sarothrias songi* Yin & Bi, 2018 from Hainan Province. Prior to the current study, no records of the genus *Derolathrus* existed in China.

In the present paper, we report the genus *Derolathrus* from China for the first time, represented by the new species *Derolathrus hainanensis* sp. nov. described and illustrated herein. Specimens of the new species were

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collected under the bark of a dead broadleaf tree. We provide a comprehensive species list, an updated identification key to known species and novel biological information for the genus *Derolathrus*.

Material and methods

Material examined is deposited in the Institute of Entomology, Guizhou University, Guiyang, China (GUGC) and the National Animal Collection Resource Center, the Institue of Zoology, Chinese Academy of Sciences (IZAS).

Label data is quoted verbatim. The Chinese translation of each locality below the provincial level is included in parentheses at its first appearance in the text. Each type specimen bears the following label: 'HOLOTYPE (red) (or PARATYPE (yellow)), m# (or f#), *Derolathrus hainanensis* sp. nov., Jiang, Chen & Yang, 2025'.

Images of habitus were taken using a Canon 5D Mark IV digital camera with a Mitutoyo Plan NIR 10 lens, a Godox MF12 flash being used as the light source. Images of morphological details were taken by a Nikon SMZ25 stereoscopic microscope with a Nikon DS-Ri2 camera. Zerene Stacker (version 1.04) was used for image stacking. Adobe Illustrator CS5 was used in the line-drawings. All images were modified and grouped into plates in Adobe Photoshop CS5 Extended.

The following abbreviations are applied: HL — length of head from the anterior clypeal margin to the occipital constriction; HW — width of head across eyes; PL — length of pronotum along the mid-line; PW — maximum width of pronotum; EL — length of elytra along the suture; EW — maximum width of elytra; BL — Length of the body is a sum of HL + PL + EL.

Results

Genus *Derolathrus* Sharp in Sharp & Scott, 1908: 430. (宽颈短跗甲属)

Type species. *Derolathrus atomus* Sharp in Sharp & Scott (1908: 431).

Derolathrus hainanensis Jiang, Chen & Yang, sp. nov.

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Figs 1–3

Chinese name. 海南宽颈短跗甲.

Type material. ***Holotype*:** CHINA • ♂, 'China: Hainan, Ledong Li Autonomous County (乐东黎族自治县), Jianfengling Area of National Park of Hainan Tropical Rainforest (海南热带雨林国家公园尖峰岭片区), MingfengGu (鸣凤谷), under bark of a dead broadleaf tree, 18°44'28"N, 108°50'38"E, H: ~ 940 m alt., 2025.III.28., Jiang Ri-Xin leg.' (GUGC). ***Paratypes*:** CHINA • 7 ♂♂, 8 ♀♀, with the same label data as the holotype (5 ♂♂, 6 ♀♀, GUGC; 2 ♂♂, 2 ♀♀, IZAS).

Diagnosis. Winged species; integument of head and pronotum with polygonal reticulation, the polygons more or less squared; surface of head and pronotum covered with sparse large punctures; disc of head with a shallow and flat longitudinal depression; eyes developed and large; pronotal disc with distinct longitudinal impression extending approximately half the pronotal length; each elytron with an entire sutural stria and one reduced second stria, which is connected at base at a shallow pit, the second elytral stria very short, less than 1/10 of the elytral length; metaventrite very long, about as long as combined length of ventrites I–V; aedeagus slender, symmetrical, with parameres distinctly medially curved and apically rounded.

Description. Male. ***Body*** (Fig. 1A) shape subcylindrical, narrowly elongate, reddish-brown, surface slightly shiny. Winged species. BL: 0.93–0.98 mm.

Head (Fig. 2A), nearly squared, wider than long, widest across eyes, HL: 0.15–0.16 mm, HW: 0.20–0.21 mm. Dorsal surface covered with micro-polygonal netting and sparse large punctures, each puncture bearing a short seta, the diameter of the puncture larger than that of ommatidia. Disc of head with a shallow and flat longitudinal depression, less than half the length of head, about twice as wide as the diameter of punctures on the head surface. Frons slightly concave between antennal tubercles. Antennae (Fig. 2D) with 11 antennomeres; longer than length of pronotum, surface covered with sparse long setae; antennomere I partially hidden by the lateral margin of head; antennomere II expanded, longer than wide; antennomeres III–IX moniliform, short and transverse; antennomeres X–XI fused and forming a club, expanded; antennomere XI slightly longer and narrower than antennomere X, with apex rounded.

Pronotum (Fig. 2B), nearly trapezoid, about as long as wide and as wide as head, widest at anterior 1/4, PL: 0.20–0.22 mm, PW: 0.20–0.21 mm. Pronotal surface with micro-polygonal netting, the polygons more or less squared and covered with sparse large punctures, each puncture bearing a short seta. Disc of pronotum with a distinct longitudinal depression, about as long as 1/2 pronotal length; width of the longitudinal depression about as wide as twice the diameter of punctures on the pronotum surface. Anterior margin weakly curved, anterior angles rounded; lateral margins finely curved at anterior 3/4 and distinctly narrowed at posterior 1/4; posterior margin curved, posterior angles obtuse. Prosternal process (Fig. 2C) with wide and round apex.

Elytra. About twice as long as wide (Fig. 3A), widest before mid-point, EL: 0.57–0.60 mm, EW: 0.25–0.27 mm. Elytral sutural stria I is distinct and long, extending from the elytral base, but not extending to the apex; stria II strongly reduced, less than 1/10 of the elytral length. Elytral surface covered with irregular micro-polygonal netting and rows of tiny and sparse punctures; punctures of elytra smaller than that of head and pronotum. Scutellum not visible.

Figure 1. Habitus of *Derolathrus hainanensis* sp. nov., male. **A.** Dorsal view; **B.** Ventral view. Scale bar: 0.5 mm (**A, B**).

Metaventrite (Fig. 3B), very long, about as long as of the combined length of abdominal ventrites 1–5, surface covered with sparse small punctures, lateral portions with longitudinal micro polygonal netting.

Abdomen (Fig. 3B) with five ventrites, ventrite 6 sometimes partially visible. Ventrite 1 about as long as ventrite 5, with lateral portions bearing polygonal netting and posterior margin nearly straight; ventrites 2–4 about the same in length, with surfaces bearing polygonal netting and sparse short setae, the posterior margin of ventrite II weakly curved and distinctly curved in ventrites 3–4. Ventrites 3–5, each with a row of round depressions at near anterior margins; posterior part of ventrite 5 with several long setae.

Legs. Femora (Fig. 2E–G) clavate, narrowed at the base, and gradually wider to apex; tibiae (Fig. 2E–G) narrower than femora, constricted at basal portions, apex with a small tooth; surface of femora and tibiae with sparse short setae; all tarsi (Fig. 2E–G) with three tarsomeres, the first and second tarsomeres short and minute, the third elongate, slightly curved in lateral view, much longer than combined length of two remaining tarsomeres.

Aedeagus (Fig. 3C) slender, symmetrical; parameres distinctly longer than median lobe, distinctly curved at middle, apex of parameres rounded.

Female. Morphologically similar to male, without distinct sexual character in habitus. Measurements of female: BL: 0.93–0.97 mm; HL: 0.16–0.18 mm; HW: 0.19–0.20 mm; PL: 0.20–0.21 mm, PW: 0.21–0.22 mm; EL: 0.55–0.59 mm, EW: 0.26–0.28 mm.

Distribution. Only known from the type locality: Jianfengling Area of National Park of Hainan Tropical Rainforest, Hainan Province, China.

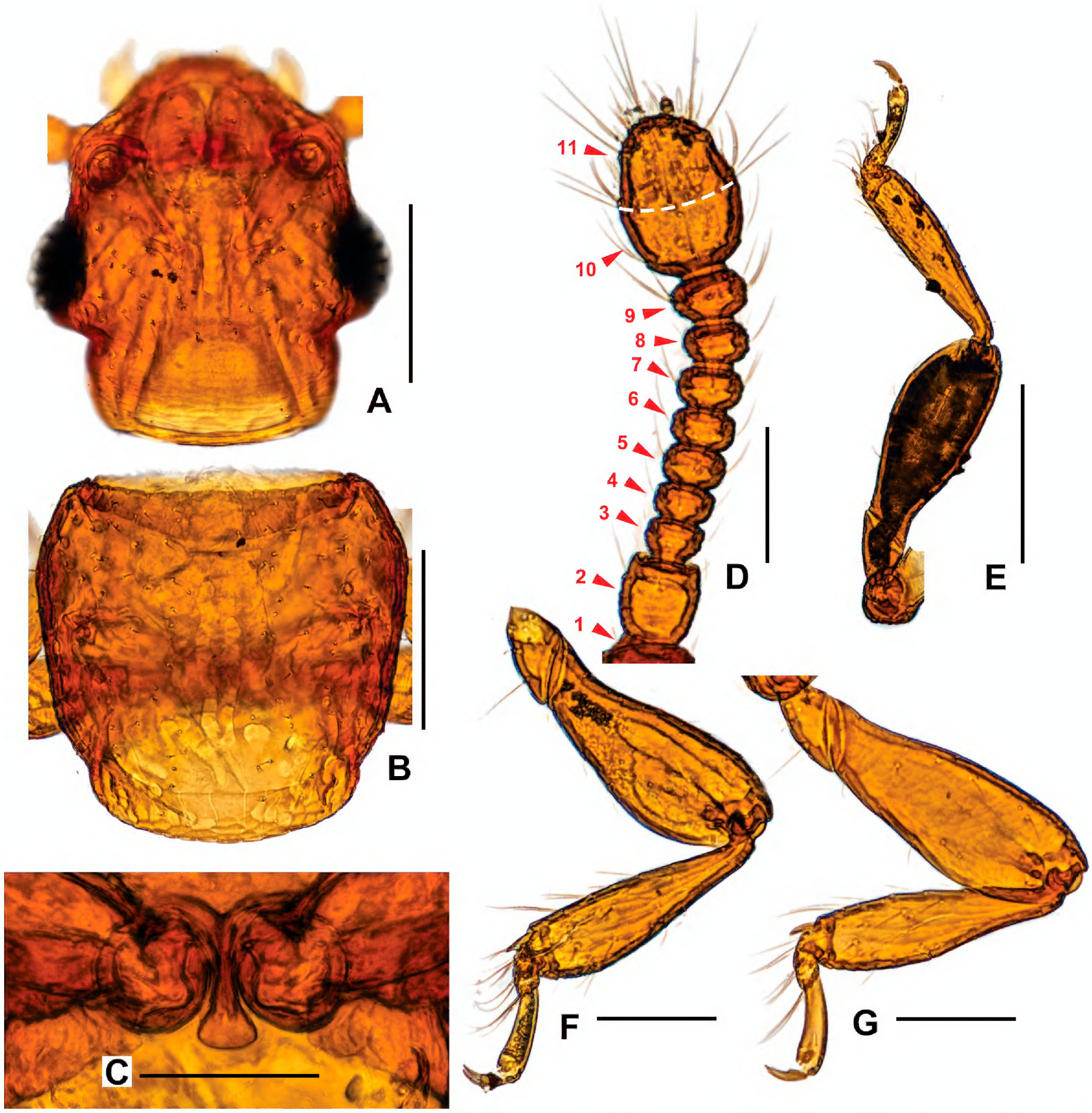

Figure 2. Diagnostic features of *Derolathrus hainanensis* sp. nov., male. **A.** Head, dorsal view; **B.** Pronotum, dorsal view; **C.** Prosternal process; **D.** Antenna; **E.** Profemur and protibia; **F.** Mesofemur and mesotibia; **G.** Metafemur and metatibia. Scale bars: 0.05 mm (**C, D, F, G**); 0.1 mm (**A, B, E**).

Biology. All adults were found under the bark of a dead broadleaf tree. The dead tree had not rotted away yet; adults of this species congregate in the damp sections under the bark, accompanied by adjacent fungal hyphae colonisation (Fig. 4).

Etymology. The specific epithet refers to the type locality: Hainan Province, China; the name is treated as an adjective.

Comparative notes. This species is morphologically very close to *D. foveiceps* Théry, 2023, both species possessing a longitudinal depression at the disc of the head and pronotum. The new species can be separated from the latter species by the surface of the pronotum without rows of setiferous depression at each side of the median depression, while the pronotum has at least 4 rows of setiferous depressions at each side of the median depression in *D. foveiceps*.

List of known *Derolathrus* species (†: fossil species)

D. abyssus Yamamoto & Parker in Yamamoto et al. 2016 †
D. anophthalmus (Franz, 1969)
D. atomus Sharp in Sharp et Scott (1908)
D. capdoliensis Tihelka, Peris, Cai & Perrichot, 2022 †

D. cavernicolus Peck, 2010
D. ceylonicus (Sen Gupta, 1979)
D. foveiceps Théry, 2023
D. groehni Cai, Leschen, Liu & Huang, 2016 †
D. hainanensis Jiang & Chen, sp. nov.
D. insularis (Dajoz, 1973)
D. parvulus (Rücker, 1983)
D. sharpi Grouvelle in Grouvelle and Raffray (1912)
D. subtilis Théry, 2023
D. troglophilus (Sen Gupta, 1979)

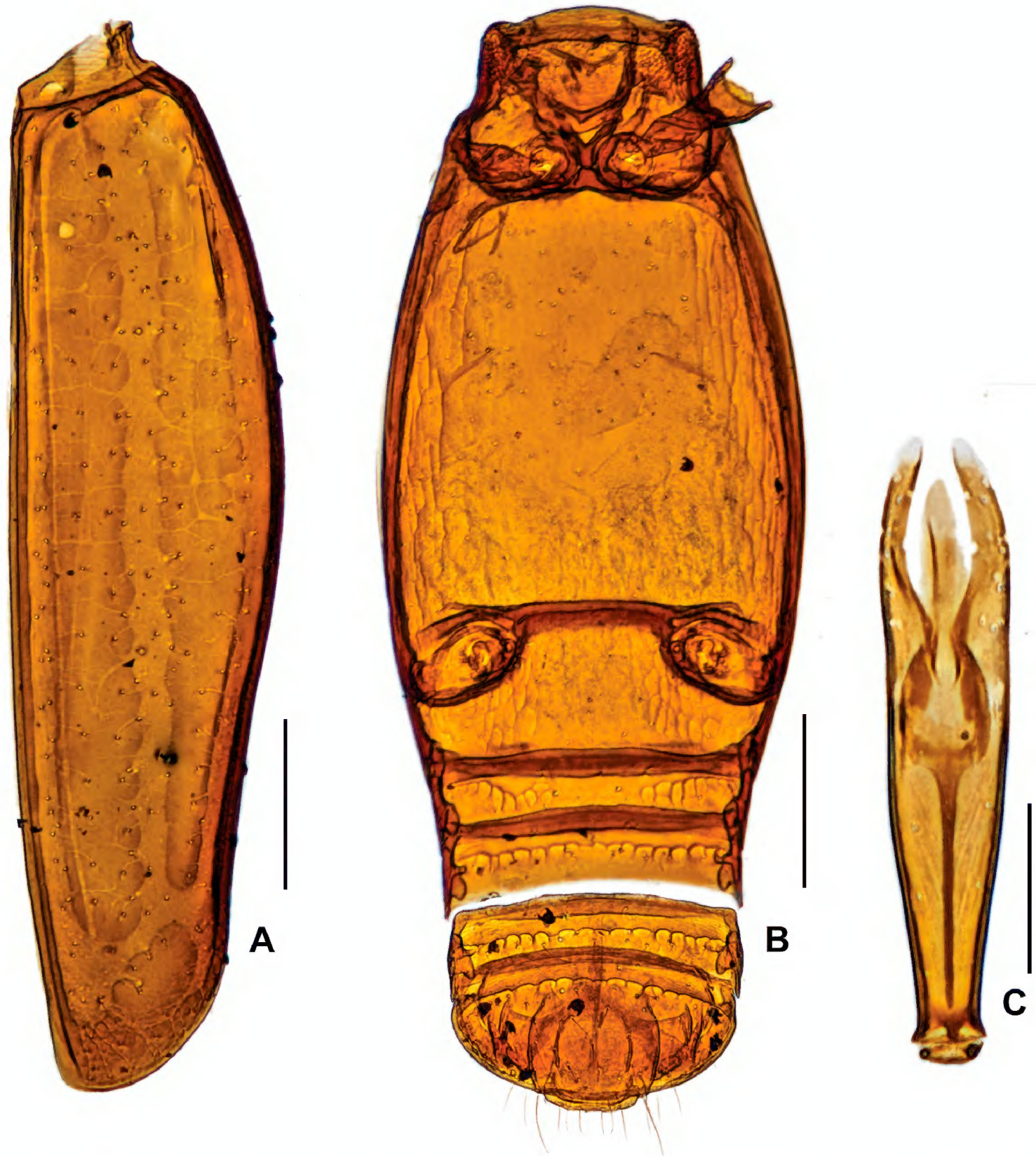

Figure 3. Diagnostic features of *Derolathrus hainanensis* sp. nov., male. **A.** Right elytron, dorsal view; **B.** Metaventrite and abdominal ventrites; **C.** Aedeagus. Scale bars: 0.1 mm (**A, B**); 0.05 mm (**C**).

Updated key to known *Derolathrus* species (based on Théry (2023b))

1 Antennomeres of antennal club not fused ..... *D. capdoliensis* †
– Antennomeres of antennal club fused 2
2 Eyes absent or strongly reduced (< 5 ommatidia) 3
– Eyes developed 4
3 Femora and tibiae swollen, temples rounded ..... *D. anophthalmus*
– Femora and tibiae slender; temples angulate ..... *D. troglophilus*
4 Metaventrite shorter than all abdominal segments combined ..... *D. abyssus* †
– Metaventrite as long as or longer than all abdominal segments combined 5
5 Head with longitudinal rows of punctures 6
– Head without longitudinal rows of punctures 7

6 Pronotum with dorsolateral ridges ..... *D. sharpi*
– Pronotum without dorsolateral ridges ..... *D. groehni* †
7 Head and pronotum dorsally with large, shallow and flat depressions; setae inserted inside small punctures localised in flat depressions 8
– Pronotum dorsally with large and deep punctures, irregularly placed, localised in polygons of the integumental netting; setae inserted between polygons 9
8 Diameter of eye greater than the distance from its anterior margin to base of antenna ..... *D. cavernicolus*
– Diameter of eye less than the distance from its anterior margin to base of antenna ..... *D. parvulus*
9 Elytra at base with no basal pit; pronotum with no discal depression ..... *D. atomus*
– Elytra with a basal pit, discal depression of pronotum visible 10
10 Discal pronotal depression deep and well-defined ..... *D. insularis*
– Discal pronotal depression shallow and ill-defined 11
11 Mesofemora swollen ..... *D. ceylonicus*
– Mesofemora not swollen 12
12 Head with longitudinal depression at disc 13
– Head without longitudinal depression ..... *D. subtilis*
13 Pronotum with at least 4 rows of setiferous depressions at each side of the median depression ..... *D. foveiceps*
– Surface of pronotum not as above, covered with sparse large punctures, punctures are irregularly arranged ..... *D. hainanensis* sp. nov.

Figure 4. Habitat of *Derolathrus hainanensis* sp. nov. **A.** Dead tree where the new species was collected; **B.** Detail with adults.

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